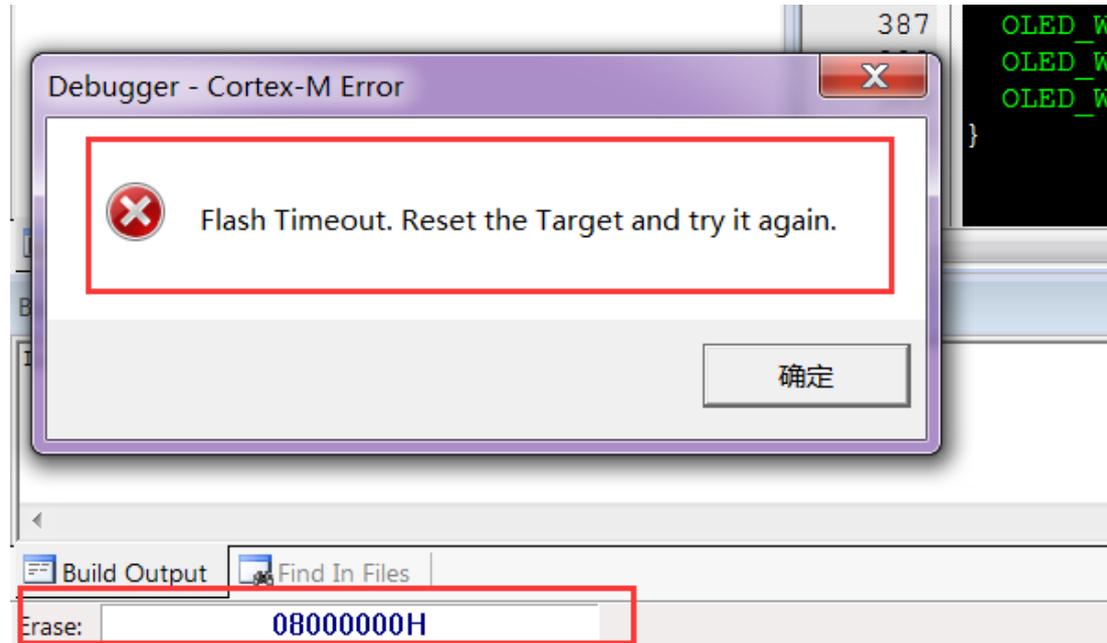


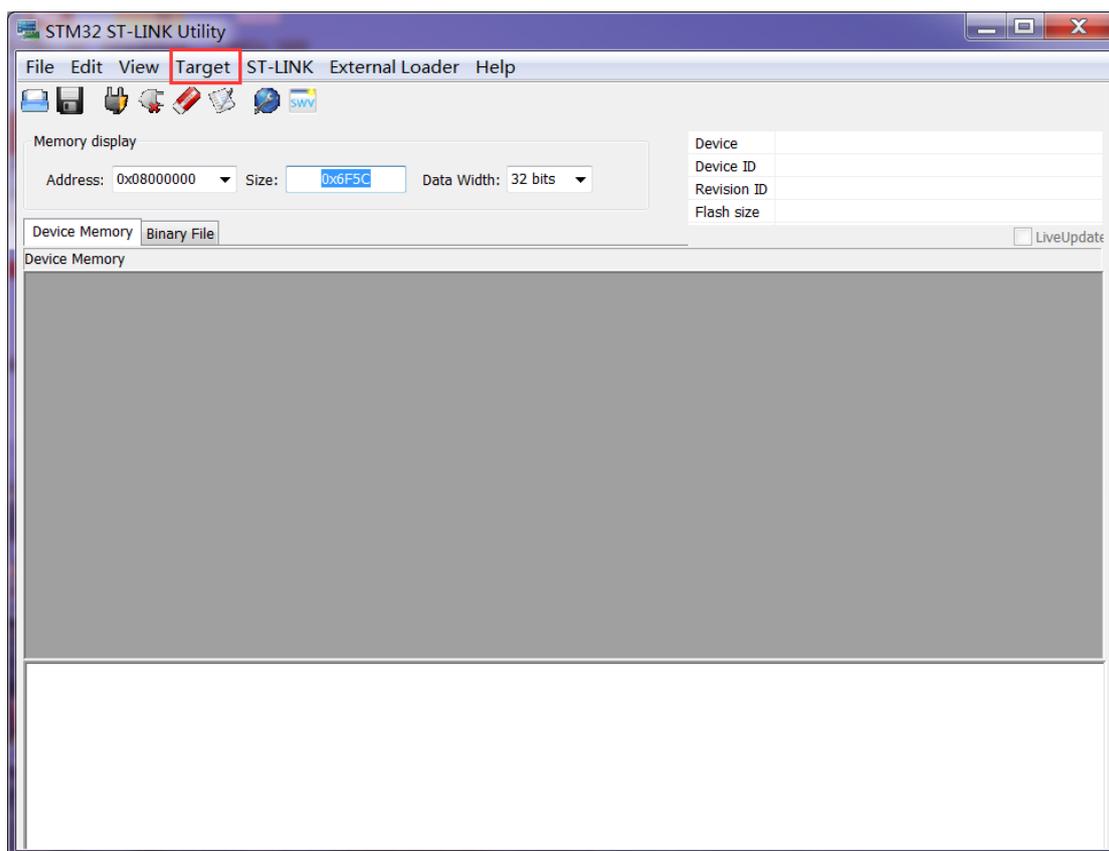
SWD 下载异常之解除读保护说明

CH32F203C8T6 开发板使用 SWD 下载程序时，可能会遇到下载异常。当出现如下异常情况时，那可能是主控 IC 的 flash 被设置了读保护，此时无法对 flash 进行读操作，所以不能擦除 flash，程序也就无法下载。

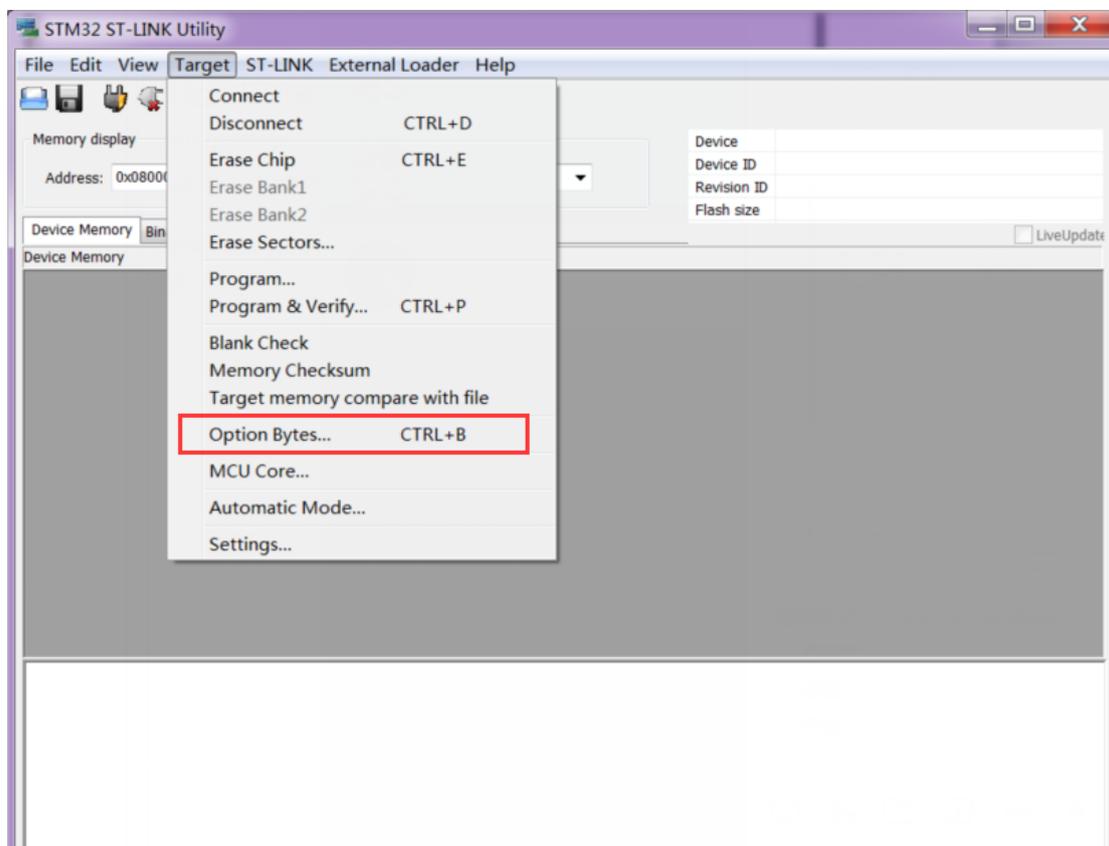


现在提供解除读保护的方法说明，步骤如下：

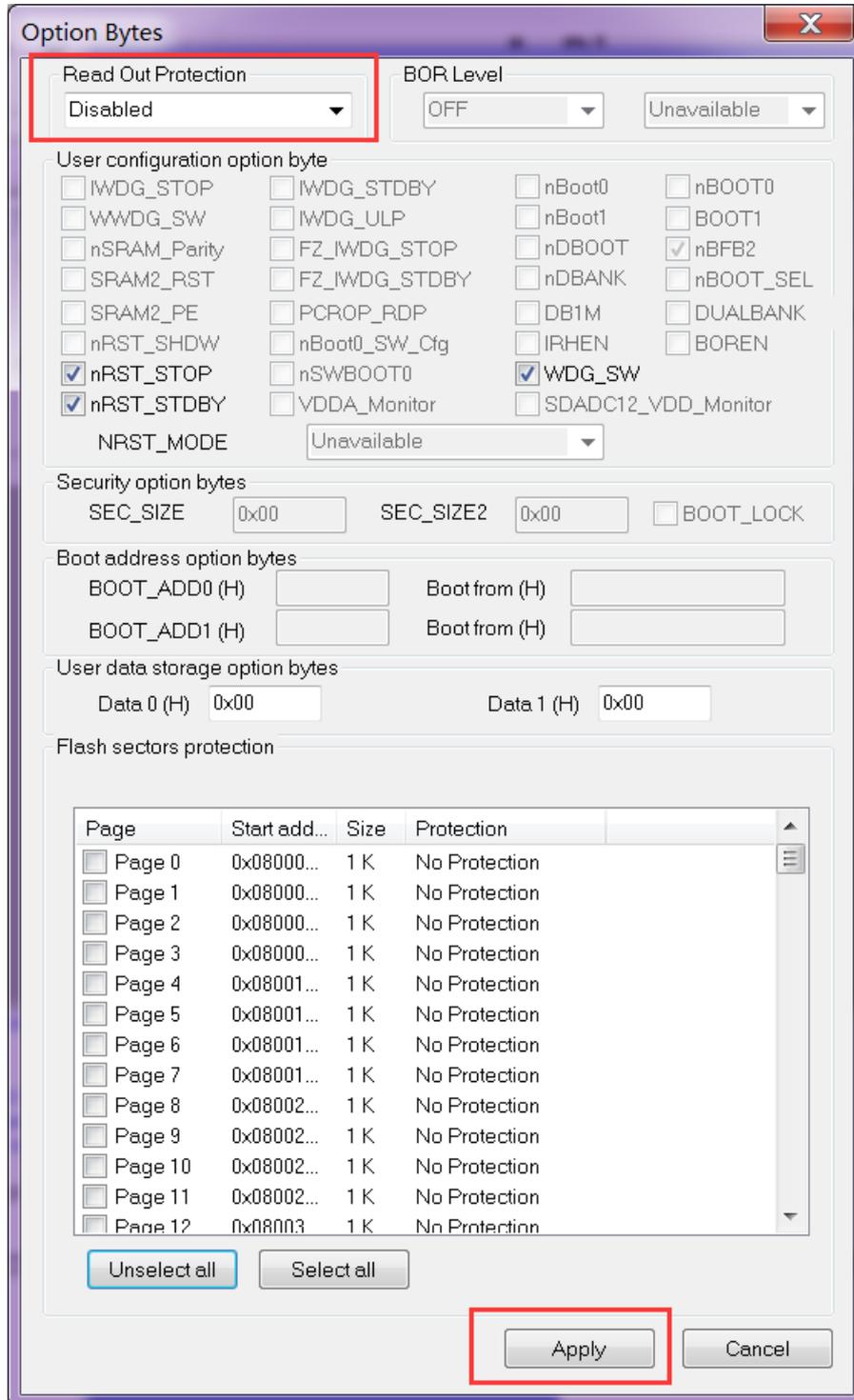
1. 确保开发板通过 SWD 方式正常连接 PC（具体方法可以查看 SWD 下载说明文档）
2. 打开 **STM32 ST-LINK Utility** 软件（需要提前在 PC 机上下载好）
3. 点击软件上的 **Target** 按钮，如下图所示：



4. 在弹出的下拉菜单里点击 **Option Bytes...**按钮，如下图所示：



5. 在弹出来的界面里将 **Read Out Protection** 由 **Enabled** 改为 **Disabled** , 然后点击 **Apply** 按钮 , 如下图所示 :



6. 出现如下界面 , 就说明读保护解除成功 , 接下来就可以使用 SWD 方式进行正常下载了。

The screenshot shows the STM32 ST-LINK Utility software interface. The window title is "STM32 ST-LINK Utility". The menu bar includes "File", "Edit", "View", "Target", "ST-LINK", "External Loader", and "Help". The toolbar contains icons for file operations and connection. The "Memory display" section shows "Address: 0x08000000", "Size: 0x6F5C", and "Data Width: 32 bits". The "Device" information panel shows: Device: STM32F10xx Medium-density, Device ID: 0x410, Revision ID: Rev B, and Flash size: Unknown. The "Device Memory @ 0x08000000" section is set to "Binary File" and has a "LiveUpdate" checkbox. The "Target memory, Address range: [0x08000000 0x08006F5C]" section displays a memory dump table with columns for Address, 0, 4, 8, C, and ASCII. The memory dump shows addresses from 0x08000000 to 0x08000090, with all data bytes being 0xFFFFFFFF. The log window at the bottom shows the following messages:

```
14:37:59 : ST-LINK SN : 53FF71067766485259261681
14:37:59 : V2J31S7
14:37:59 : Connected via SWD.
14:37:59 : SWD Frequency = 4,0 MHz.
14:37:59 : Connection mode : Normal.
14:37:59 : Debug in Low Power mode enabled.
14:37:59 : Device ID:0x410
14:37:59 : Device family :STM32F10xx Medium-density
14:43:21 : Option bytes updated successfully.
```